

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	W-CI2 System										Solid	Solid	Solid	Gas P>1 atm	Liquid					
2											W	WCI₂	WCI₄	WCI₅	WCI₆					
3										i	1	1	1	1	1					
4										k	0	2	4	5	6					
5										500		-46.819	-72.934	-78.535	-87.269					
6										1000		-34.153	-44.177	-44.975	-44.834					
7										1500		-23.205	-19.279	-15.245	-6.238					
8										A		-58340	-99118	-109542	-127145					
9										B		23.61	53.66	63.29	81.03					
10										TI					504					
11										Th				[771]	526					555
12																				
13										PCI₂	-30	-16.09		-8.29		-3.38		-5.07		10
14											-30	-16.09		-8.29			-4.23			10
15																				
16											W	WCI2	WCI4							
17																				
18																				
19	Gas										-30.00	-16.09		-8.29			-4.23			10.00
20	W	1	0	186.558	169.514	151.751	204081	-34.81	LogPw	-81.94	-81.94			-89.74			-97.86			-140.54
21	WCI	1	1	118.33	105.026	92.254	131279	-26.08		-68.51	-61.56			-65.46			-71.55			-107.11
22	WCI₂	1	2	-9.411	-15.735	-21.903	-3191	-12.49		-31.57	-17.66			-17.66			-21.72			-50.17
23	WCI₄	1	4	-68.514	-57.361	-46.51	-79466	22.00		-26.25	1.58			9.38			9.38			-4.85
24	WCI₅	1	5	-76.713	-55.968	-35.89	-97013	40.82		-30.75	4.04			15.74			17.77			10.65
25	WCI₆	1	6	-84.492	-52.472	-22.04	-115453	62.45		-34.30	7.43			23.03			27.10			27.10
26	W₂CI₁₀	2	10	-152.441	-101.401	-52.779	-201869	99.66		-54.70	14.86			38.26			42.33			28.10
27	Wt									-26.25	15.16			38.57			42.63			28.42
28																				
29																				
30																				
31																				
32																				
33																				
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51																				
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53																				
54																				

RUN from 300 to 1800 in 5 steps

Wtotal

	W	W/WCI2	WCI2/WCI4	WCI4/WCI6	WCI6/WCI6
500	-40.000	-20.337	-11.258	-6.389	10.000
	-40.406	8.621	35.860	40.728	26.130
600	-30.000	-16.088	-8.287	-4.225	10.000
	-26.249	15.165	38.566	42.628	28.424
700	-30.000	-13.052	-6.166	-2.767	10.000
	-30.365	19.838	40.499	43.897	31.131
800	-30.000	-10.776	-4.574	-1.673	10.000
	-31.848	23.344	41.948	44.849	33.176

x

-16.09

-16.09

-8.29

-8.29

-4.23

-4.23

y

-130

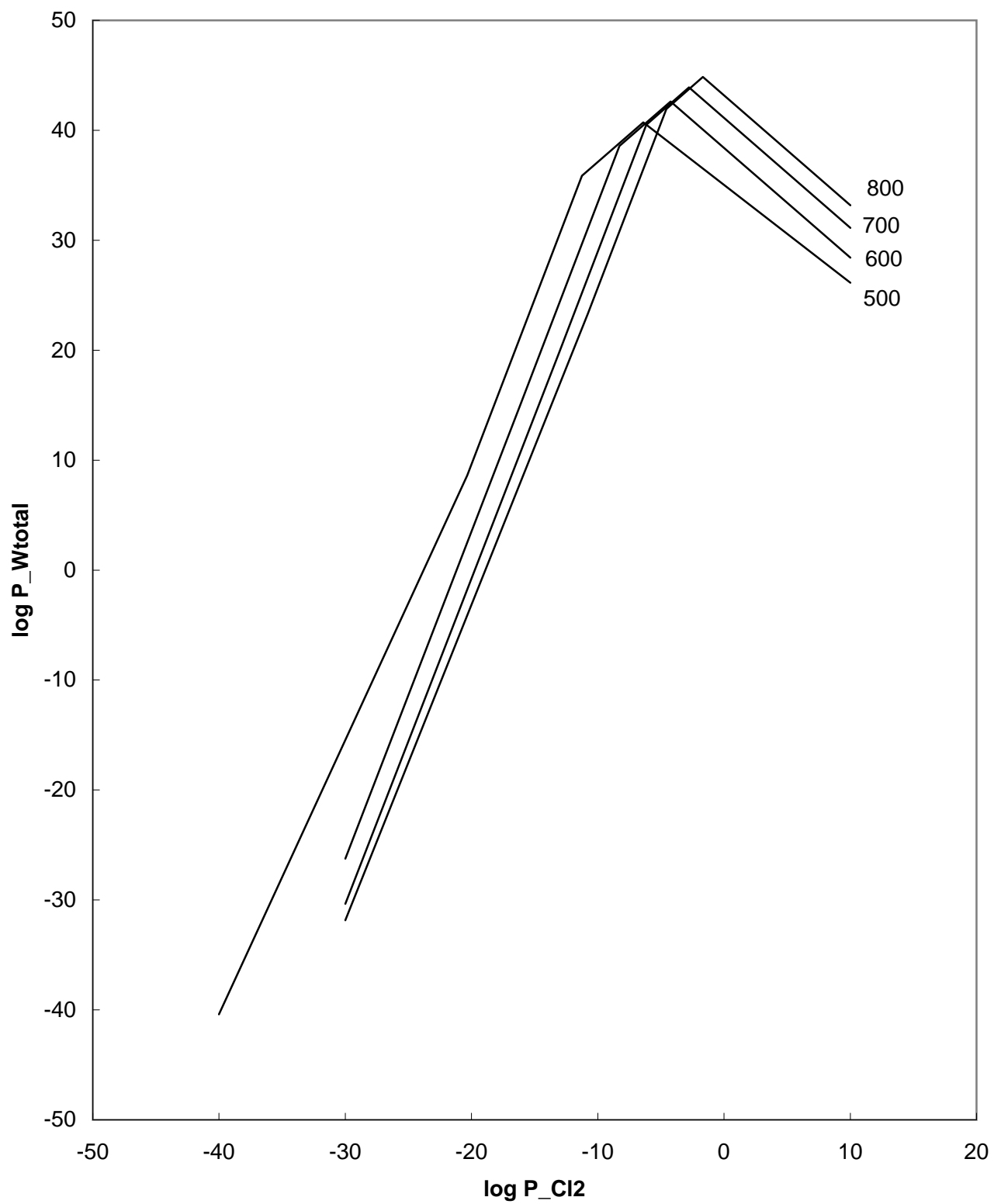
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-130

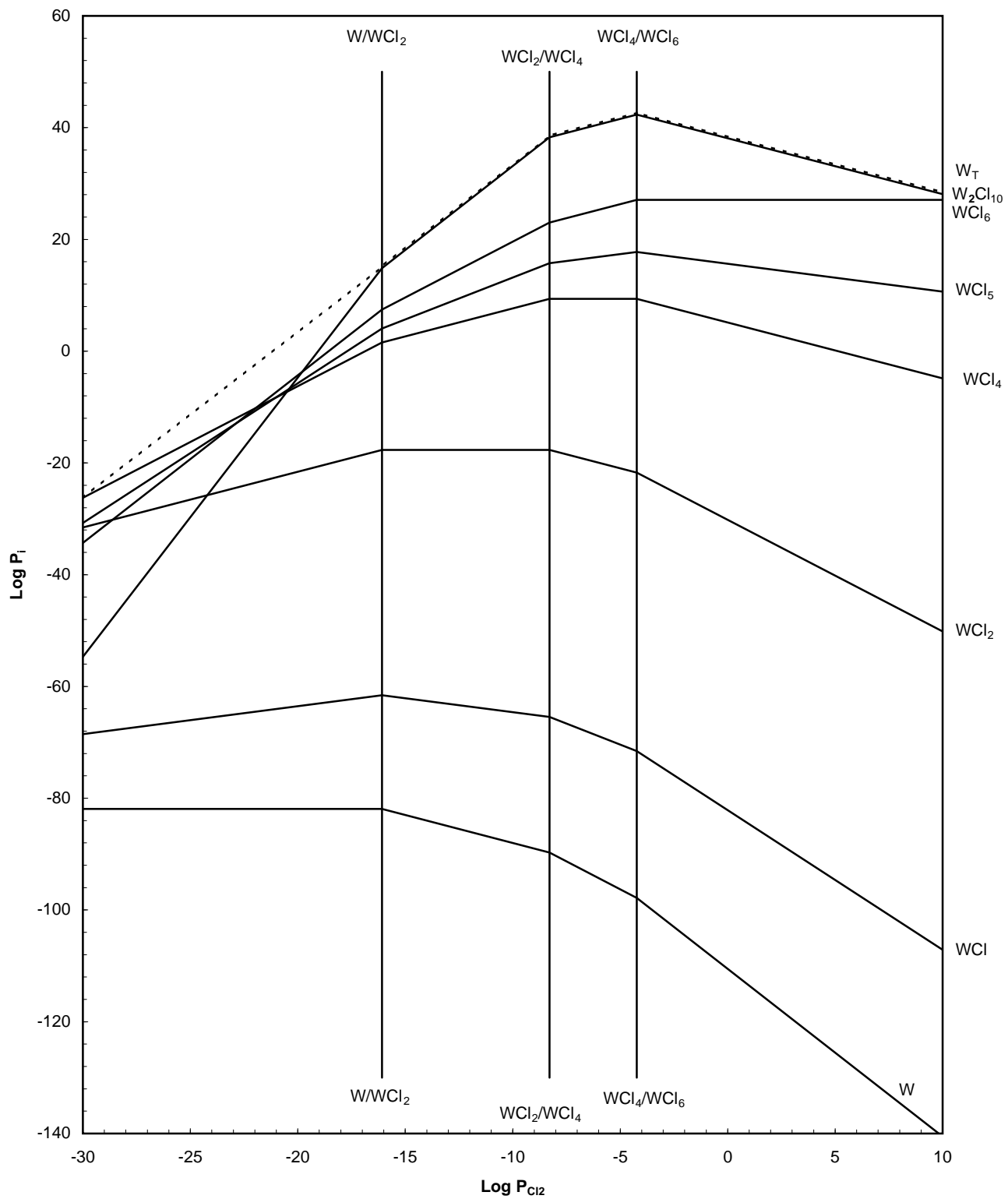
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-130

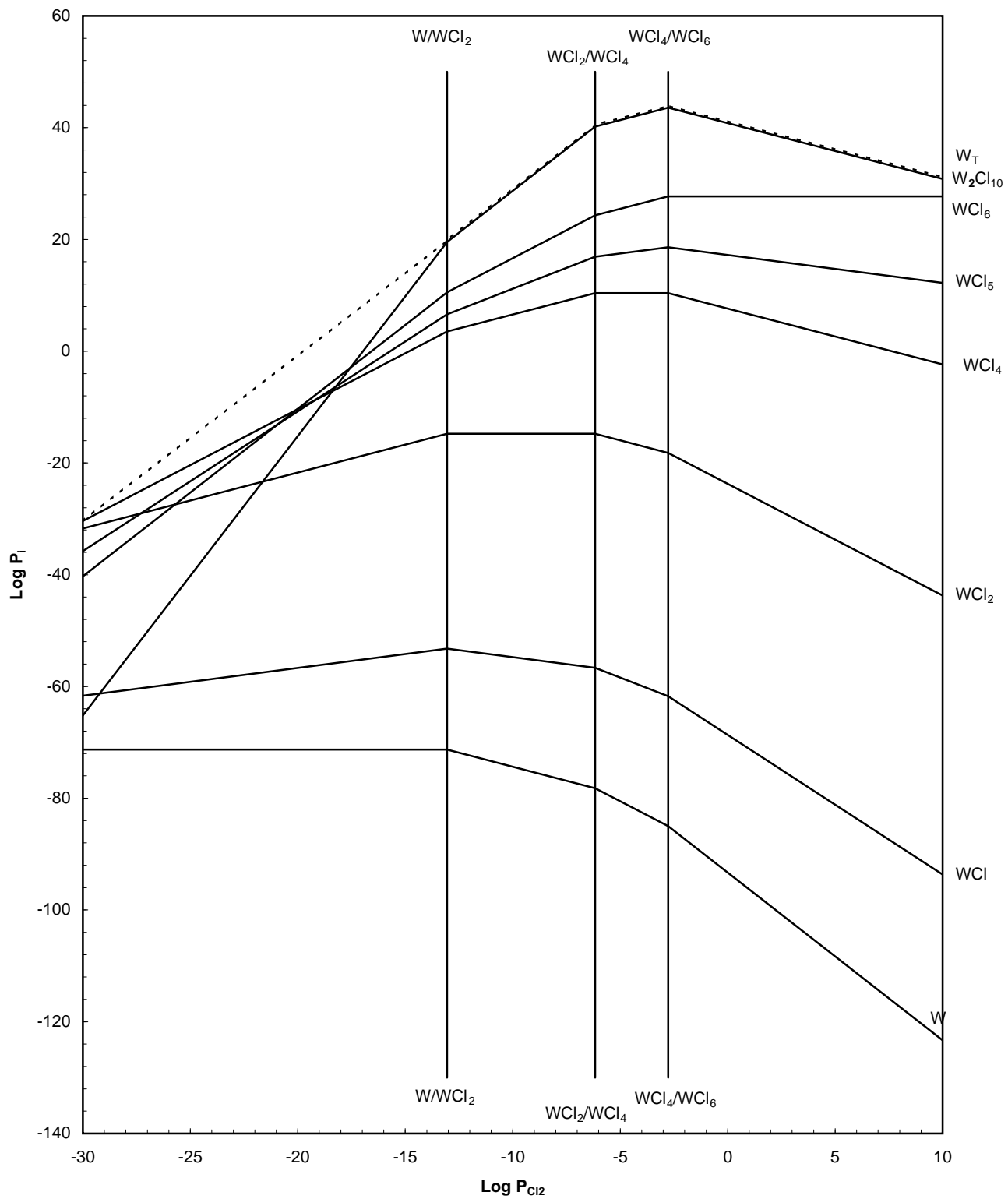
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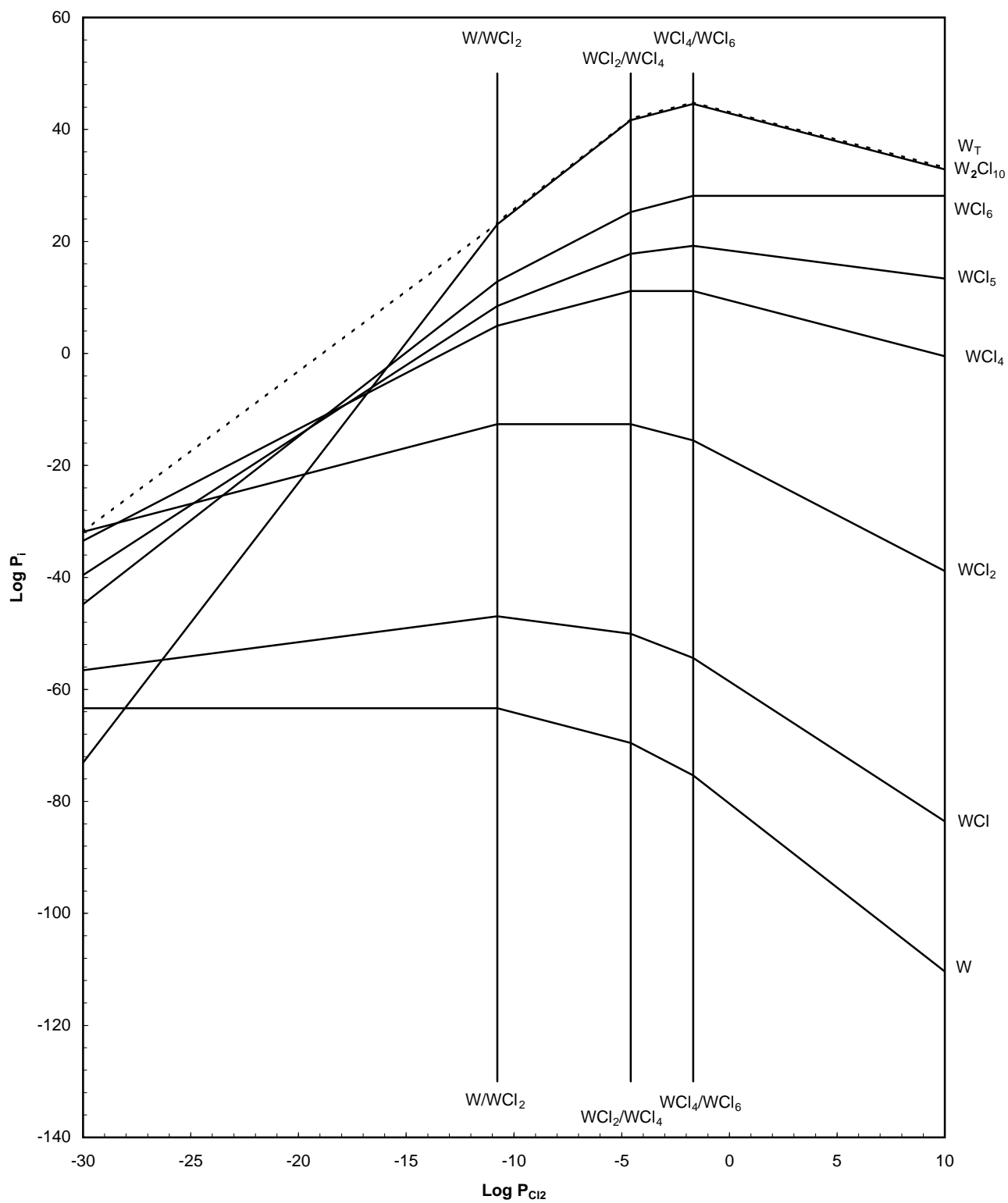
Total Effective W-bearing Gaseous Species Pressure in the W-Cl₂ System



Pressures of W-bearing Species in the W-Cl₂ System at 600 K



Pressures of W-bearing Species in the W-Cl₂ System at 700 K



Pressures of W-bearing Species in the W-Cl₂ System at 800 K

	A	B	C	D	E	F	G	H	I	J
1	W-CI2 System									
2										
3										i
4										k
5									500	
6									1000	
7									1500	
8										A
9										B
10										TI
11										Th
12										
13									PCI ₂	=ROUNDDOWN((L13-20)/10,0)*10
14										=ROUNDDOWN((L14-20)/10,0)*10
15										
16										
17										
18										
19	Gas									=J14
20	W	1	0	186.558	169.514	151.751	=1000*INTERCEPT(D20:F20,\$J5:\$J7)	=1000*SLOPE(D20:F20,\$J5:\$J7)	LogPw	=L20+(L\$13-J\$13)*(K\$4-\$C20)/2
21	WCI	1	1	118.33	105.026	92.254	=1000*INTERCEPT(D21:F21,\$J5:\$J7)	=1000*SLOPE(D21:F21,\$J5:\$J7)		=L21+(L\$13-J\$13)*(K\$4-\$C21)/2
22	WCI ₂	1	2	-9.411	-15.735	-21.903	=1000*INTERCEPT(D22:F22,\$J5:\$J7)	=1000*SLOPE(D22:F22,\$J5:\$J7)		=L22+(L\$13-J\$13)*(K\$4-\$C22)/2
23	WCI ₄	1	4	-68.514	-57.361	-46.51	=1000*INTERCEPT(D23:F23,\$J5:\$J7)	=1000*SLOPE(D23:F23,\$J5:\$J7)		=L23+(L\$13-J\$13)*(K\$4-\$C23)/2
24	WCI ₅	1	5	-76.713	-55.968	-35.89	=1000*INTERCEPT(D24:F24,\$J5:\$J7)	=1000*SLOPE(D24:F24,\$J5:\$J7)		=L24+(L\$13-J\$13)*(K\$4-\$C24)/2
25	WCI ₆	1	6	-84.492	-52.472	-22.04	=1000*INTERCEPT(D25:F25,\$J5:\$J7)	=1000*SLOPE(D25:F25,\$J5:\$J7)		=L25+(L\$13-J\$13)*(K\$4-\$C25)/2
26	W ₂ CI ₁₀	2	10	-152.441	-101.401	-52.779	=1000*INTERCEPT(D26:F26,\$J5:\$J7)	=1000*SLOPE(D26:F26,\$J5:\$J7)		=L26+(L\$13-J\$13)*(K\$4-\$C26)/2
27	Wt									=LOG(10^J20+10^J21+10^J22+10^J23+10^J24+10^J25+2*10^J26)
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
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52										
53										
54										

RUN from 300 to 1800 in 5 steps

800

_T

K	
800	=SK\$17
	=IF(T=\$I\$31,\$J19,\$J32)
W	=IF(T=\$I\$31,\$J20,\$J33)
WCI	=IF(T=\$I\$31,\$J21,\$J34)
WCI ₂	=IF(T=\$I\$31,\$J22,\$J35)
WCI ₄	=IF(T=\$I\$31,\$J23,\$J36)
WCI ₅	=IF(T=\$I\$31,\$J24,\$J37)
WCI ₆	=IF(T=\$I\$31,\$J25,\$J38)
W ₂ CI ₁₀	=IF(T=\$I\$31,\$J26,\$J39)
Wt	=IF(T=\$I\$31,\$J27,\$J40)
Wtotal	
500	=IF(T=\$I43,J\$19,J43)
	=IF(T=\$I43,J\$27,J44)
600	=IF(T=\$I46,J\$19,J46)
	=IF(T=\$I46,J\$27,J47)
700	=IF(T=\$I49,J\$19,J49)
	=IF(T=\$I49,J\$27,J50)
800	=IF(T=\$I52,J\$19,J52)
	=IF(T=\$I52,J\$27,J53)

	K	L	M
1	Solid		Solid
2	W		WCl₂
3	1		1
4	0		2
5			-46.819
6			-34.153
7			-23.205
8			=1000*INTERCEPT(M5:M7,\$J5:\$J7)
9			=1000*SLOPE(M5:M7,\$J5:\$J7)
10			
11			
12			
13		=((M8-K8)+(M9-K9)*T)/2.303/1.987/T^2/(M4-K4)	
14		=IF(AND(K14="",M14=""),L13,"")	=IF(L13>N13,((O8-K8)+(O9-K9)*T)/2.303/1.987/T^2/(O4-K4),"")
15			
16			
17	=K\$2		=IF(SUM(M14:M16)=0,M\$2,"")
18			
19		=L14	
20		=(-(G20-\$K\$8)+(H20-\$K\$9)*T)/2.303/1.987/T +C20/2*L\$13	
21		=(-(G21-\$K\$8)+(H21-\$K\$9)*T)/2.303/1.987/T +C21/2*L\$13	
22		=(-(G22-\$K\$8)+(H22-\$K\$9)*T)/2.303/1.987/T +C22/2*L\$13	
23		=(-(G23-\$K\$8)+(H23-\$K\$9)*T)/2.303/1.987/T +C23/2*L\$13	
24		=(-(G24-\$K\$8)+(H24-\$K\$9)*T)/2.303/1.987/T +C24/2*L\$13	
25		=(-(G25-\$K\$8)+(H25-\$K\$9)*T)/2.303/1.987/T +C25/2*L\$13	
26		=(-(G26-\$K\$8)+(H26-\$K\$9)*T)/2.303/1.987/T +C26/2*L\$13	
27		=LOG(10^L20+10^L21+10^L22+10^L23+10^L24+10^L25+2*10^L26)	
28			
29			
30			
31	=K17 & "I" & M17	=M17 & "I" & O17	=SQ\$17 & "I" & IF(\$Q\$17<>"",SQ\$17,\$S\$17)
32	=IF(T=\$I\$31,\$L19,\$K32)	=IF(T=\$I\$31,\$N19,\$L32)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP19,\$Q19)),SM32)
33	=IF(T=\$I\$31,\$L20,\$K33)	=IF(T=\$I\$31,\$N20,\$L33)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP20,\$Q20)),SM33)
34	=IF(T=\$I\$31,\$L21,\$K34)	=IF(T=\$I\$31,\$N21,\$L34)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP21,\$Q21)),SM34)
35	=IF(T=\$I\$31,\$L22,\$K35)	=IF(T=\$I\$31,\$N22,\$L35)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP22,\$Q22)),SM35)
36	=IF(T=\$I\$31,\$L23,\$K36)	=IF(T=\$I\$31,\$N23,\$L36)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP23,\$Q23)),SM36)
37	=IF(T=\$I\$31,\$L24,\$K37)	=IF(T=\$I\$31,\$N24,\$L37)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP24,\$Q24)),SM37)
38	=IF(T=\$I\$31,\$L25,\$K38)	=IF(T=\$I\$31,\$N25,\$L38)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP25,\$Q25)),SM38)
39	=IF(T=\$I\$31,\$L26,\$K39)	=IF(T=\$I\$31,\$N26,\$L39)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP26,\$Q26)),SM39)
40	=IF(T=\$I\$31,\$L27,\$K40)	=IF(T=\$I\$31,\$N27,\$L40)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",SP27,\$Q27)),SM40)
41			
42			
43	=IF(T=\$I43,L\$19,K43)	=IF(T=\$I43,N\$19,L43)	=IF(T=\$I43,Q\$19,M43)
44	=IF(T=\$I43,L\$27,K44)	=IF(T=\$I43,N\$27,L44)	=IF(T=\$I43,Q\$27,M44)
45			
46	=IF(T=\$I46,L\$19,K46)	=IF(T=\$I46,N\$19,L46)	=IF(T=\$I46,Q\$19,M46)
47	=IF(T=\$I46,L\$27,K47)	=IF(T=\$I46,N\$27,L47)	=IF(T=\$I46,Q\$27,M47)
48			
49	=IF(T=\$I49,L\$19,K49)	=IF(T=\$I49,N\$19,L49)	=IF(T=\$I49,Q\$19,M49)
50	=IF(T=\$I49,L\$27,K50)	=IF(T=\$I49,N\$27,L50)	=IF(T=\$I49,Q\$27,M50)
51			
52	=IF(T=\$I52,L\$19,K52)	=IF(T=\$I52,N\$19,L52)	=IF(T=\$I52,Q\$19,M52)
53	=IF(T=\$I52,L\$27,K53)	=IF(T=\$I52,N\$27,L53)	=IF(T=\$I52,Q\$27,M53)
54			

	N	O
1		=IF(T>771,"Gas P>1 atm","Solid")
2		WCI _i
3		1
4		4
5		-72.934
6		-44.177
7		-19.279
8		=1000*INTERCEPT(O5:O7,\$J5:\$J7)
9		=1000*SLOPE(O5:O7,\$J5:\$J7)
10		
11		[771]
12		
13	=((O8-M8)+(O9-M9)*T)/2.303/1.987/T^2/(O4-M4)	
14	=IF(AND(M14="",O14=""),N13,"")	=IF(N13>P13,((Q8-M8)+(Q9-M9)*T)/2.303/1.987/T^2/(Q4-M4),"")
15		
16		
17		=IF(SUM(O14:O16)=0,O\$2,"")
18		
19	=N14	
20	=L20+(N\$13-L\$13)*(\$C20-M\$4)/2	
21	=L21+(N\$13-L\$13)*(\$C21-M\$4)/2	
22	=L22+(N\$13-L\$13)*(\$C22-M\$4)/2	
23	=L23+(N\$13-L\$13)*(\$C23-M\$4)/2	
24	=L24+(N\$13-L\$13)*(\$C24-M\$4)/2	
25	=L25+(N\$13-L\$13)*(\$C25-M\$4)/2	
26	=L26+(N\$13-L\$13)*(\$C26-B\$26*M\$4)/2	
27	=LOG(10^N20+10^N21+10^N22+10^N23+10^N24+10^N25+2*10^N26)	
28		
29		
30		
31	=IF(\$Q\$17<>""),\$Q\$17,\$S\$17) & " " & \$S\$17	=IF(\$Q\$17<>"" , \$S\$17,"")
32	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R19,\$T19)),N32)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T19,"")),N32)
33	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R20,\$T20)),N33)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T20,"")),N33)
34	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R21,\$T21)),N34)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T21,"")),N34)
35	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R22,\$T22)),N35)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T22,"")),N35)
36	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R23,\$T23)),N36)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T23,"")),N36)
37	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R24,\$T24)),N37)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T24,"")),N37)
38	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R25,\$T25)),N38)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T25,"")),N38)
39	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R26,\$T26)),N39)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T26,"")),N39)
40	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$R27,\$T27)),N40)	=IF(T=\$I\$31,(IF(\$Q\$17<>"",\$T27,"")),N40)
41		
42		
43	=IF(T=\$I43,T\$19,N43)	
44	=IF(T=\$I43,T\$27,N44)	
45		
46	=IF(T=\$I46,T\$19,N46)	
47	=IF(T=\$I46,T\$27,N47)	
48		
49	=IF(T=\$I49,T\$19,N49)	
50	=IF(T=\$I49,T\$27,N50)	
51		
52	=IF(T=\$I52,T\$19,N52)	
53	=IF(T=\$I52,T\$27,N53)	
54		

	P	Q
1		=IF(T<526,"Solid",IF(T>561,"Gas P>1 atm","Liquid"))
2		WCl ₅
3		1
4		5
5		=IF(T<526,-78.777,-78.535)
6		=IF(T<526,-41.055,-44.975)
7		=IF(T<526,-8.879,-15.245)
8		=1000*INTERCEPT(Q5:Q7,\$J5:\$J7)
9		=1000*SLOPE(Q5:Q7,\$J5:\$J7)
10		
11		526
12		
13	=((Q8-O8)+(Q9-O9)*T)/2.303/1.987/T^2/(Q4-O4)	
14	=IF(AND(O14="",Q14=""),P13,"")	=IF(P13>R13,((S8-O8)+(S9-O9)*T)/2.303/1.987/T^2/(S4-O4),"")
15		
16		
17		=IF(SUM(Q14:Q16)=0,Q\$2,"")
18		
19	=P14	=Q14
20	=IF(P19<>"",N20+(P\$13-N\$13)*(C20-O\$4)/2,"")	=IF(Q19<>"",N20+(Q\$14-N\$13)*(C20-O\$4)/2,"")
21	=IF(P20<>"",N21+(P\$13-N\$13)*(C21-O\$4)/2,"")	=IF(Q20<>"",N21+(Q\$14-N\$13)*(C21-O\$4)/2,"")
22	=IF(P21<>"",N22+(P\$13-N\$13)*(C22-O\$4)/2,"")	=IF(Q21<>"",N22+(Q\$14-N\$13)*(C22-O\$4)/2,"")
23	=IF(P22<>"",N23+(P\$13-N\$13)*(C23-O\$4)/2,"")	=IF(Q22<>"",N23+(Q\$14-N\$13)*(C23-O\$4)/2,"")
24	=IF(P23<>"",N24+(P\$13-N\$13)*(C24-O\$4)/2,"")	=IF(Q23<>"",N24+(Q\$14-N\$13)*(C24-O\$4)/2,"")
25	=IF(P24<>"",N25+(P\$13-N\$13)*(C25-O\$4)/2,"")	=IF(Q24<>"",N25+(Q\$14-N\$13)*(C25-O\$4)/2,"")
26	=IF(P25<>"",N26+(P\$13-N\$13)*(C26-O\$4)/2,"")	=IF(Q25<>"",N26+(Q\$14-N\$13)*(C26-\$B26*O\$4)/2,"")
27	=IF(P19<>"",LOG(10^P20+10^P21+10^P22+10^P23+10^P24+10^P25+2*10^P26),"")	=IF(Q19<>"",LOG(10^Q20+10^Q21+10^Q22+10^Q23+10^Q24+10^Q25+2*10^Q26),"")
28		
29		
30		
31		x
32		=K32
33		=Q32
34		
35		=L32
36		=Q35
37		
38		=M32
39		=Q38
40		
41		=IF(O32<>"",N32,"")
42		=Q41
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		

	R	S
1		=IF(T<555,"Solid",IF(T>614,"Gas P>1 atm","Liquid"))
2		WCI ₆
3		1
4		6
5		=IF(T<504,-87.419,-87.269)
6		=IF(T<504,-43.12,-44.834)
7		=IF(T<504,-1.875,-6.238)
8		=1000*INTERCEPT(S5:S7,\$J5:\$J7)
9		=1000*SLOPE(S5:S7,\$J5:\$J7)
10		504
11		555
12		
13	=((S8-Q8)+(S9-Q9)*T)/2.303/1.987/T^2*(S4-Q4)	
14	=IF(AND(Q14="",S14=""),R13,"")	
15		
16		
17		=\$\$2
18		
19	=R14	
20	=IF(R19<>"",P20+(R\$13-P\$13)*(\$C20-Q\$4)/2,"")	
21	=IF(R20<>"",P21+(R\$13-P\$13)*(\$C21-Q\$4)/2,"")	
22	=IF(R21<>"",P22+(R\$13-P\$13)*(\$C22-Q\$4)/2,"")	
23	=IF(R22<>"",P23+(R\$13-P\$13)*(\$C23-Q\$4)/2,"")	
24	=IF(R23<>"",P24+(R\$13-P\$13)*(\$C24-Q\$4)/2,"")	
25	=IF(R24<>"",P25+(R\$13-P\$13)*(\$C25-Q\$4)/2,"")	
26	=IF(R25<>"",P26+(R\$13-P\$13)*(\$C26-Q\$4)/2,"")	
27	=IF(R19<>"",LOG(10^R20+10^R21+10^R22+10^R23+10^R24+10^R25+2*10^R26),"")	
28		
29		
30		
31		y
32	-130	
33	50	
34		
35	=R32	
36	=R33	
37		
38	=R32	
39	=R33	
40		
41	=IF(Q41<>"",R32,"")	
42	=IF(Q42<>"",R33,"")	
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		

	T
1	
2	
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12	
13	=ROUNDDOWN((IF(Q14="",R13,Q14)+20)/10,0)*10
14	=T13
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17	
18	
19	=T14
20	=IF(R19<>"",R20,Q20)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C20-S\$4)/2
21	=IF(R20<>"",R21,Q21)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C21-S\$4)/2
22	=IF(R21<>"",R22,Q22)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C22-S\$4)/2
23	=IF(R22<>"",R23,Q23)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C23-S\$4)/2
24	=IF(R23<>"",R24,Q24)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C24-S\$4)/2
25	=IF(R24<>"",R25,Q25)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C25-S\$4)/2
26	=IF(R25<>"",R26,Q26)+(IF(R\$19<>"",T\$19-R\$19,T\$19-Q\$19))*(\$C26-S\$4)/2
27	=LOG(10^T20+10^T21+10^T22+10^T23+10^T24+10^T25+2*10^T26)
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